DECLARATION

I, Takahiro SHIMIZU of Ark Mori Building, 13F, 12-32, Akasaka 1-chome, Minato-ku, Tokyo 107, Japan, do hereby certify that I am conversant with the English and Japanese languages and am a competent translator thereof, and I further certify that to the best of my knowledge and belief the following is a true and correct translation made by me of the Japanese specification JP2000-267954 as filed attached hereto.

Signed this 8th day of April 8, 2005

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[Document name] Specification

[Title of the invention]

VOICE RECOGNITION UNIT AND METHOD THEREOF

[claim scope of the invention]

5   [Claim 1]   A voice recognition unit, comprising:

plural speech recognition dictionaries mutually hierarchically related;

extracting means that extracts a desired dictionary out of the speech recognition dictionaries as a list

10   of queuing words;

selecting means that selects a desired dictionary out of the speech recognition dictionaries;

storing means that stores the dictionary selected by the selecting means as a list of queuing words at

15   a higher-order hierarchy than a hierarchy set beforehand together with the normal dictionary extracting by the extracting means; and

recognizing means that recognizes input voice by comparing the input voice and the list of queuing words

20   stored in the storing means.

[Claim 2]   A voice recognition unit according to Claim 1, comprising as the speech recognition dictionaries:

a   classification   dictionary   storing   the

25   classification names of institutions; and

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an institution dictionary storing the names of institutions which belong to a type of institutions every type.

[Claim 3]　A voice recognition unit according

5　to Claim 1 or 2, comprising as the speech recognition dictionaries:

an area dictionary storing area names; and

an institution dictionary storing the names of institutions existing in any area every area.

10　[Claim 4]　A voice recognition unit according to Claim 2 or 3, wherein:

the selecting means selects the institution dictionary as a desired dictionary.

[Claim 5]　A voice recognition unit according

15　to Claim 4, wherein:

the extracting means extracts a dictionary at a low-order hierarchy of recognized voice as queuing words; and

the extracting means extracts a dictionary which

20　belongs to a dictionary selected by the selecting means and which is located at a low-order hierarchy of the recognized voice extracts as queuing words.

[Claim 6]　A voice recognition method, wherein:

it is used for a voice recognition unit having plural

25　speech　　recognition　　dictionaries　　mutually

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hierarchically related; and

processing for recognizing input voice is executed using dictionaries classified according to at least one narrowing-down condition set by a user beforehand

5 together with a dictionary for narrowing down at a high-order hierarchy as objects of recognition.

[Claim 7]   A voice recognition method according to Claim 6, wherein:

dictionaries classified according to at least one
10 narrowing-down condition set by a user beforehand are dictionaries the frequency of use of which is high.

[Claim 8]   A voice recognition unit, comprising:

plural speech recognition dictionaries mutually hierarchically related;

15 extracting means that extracts a desired dictionary out of the speech recognition dictionaries as a list of queuing words;

storing means that stores the list of queuing words in the dictionary extracted by the extracting means;
20 and

recognizing means that recognizes input voice by comparing the input voice and the list of queuing words stored in the storing means, wherein:

when voice is recognized by the recognizing means,
25 the extracting means extracts a dictionary at a low-order

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hierarchy of recognized voice as queuing words and the storing means stores it; and

a queuing word related to the recognized voice out of the queuing words stored in the storing means when 5 the voice is recognized is stored as an object of comparison in succession.

[Claim 9] A voice recognition method for recognizing input voice by extracting a desired dictionary out of plural speech recognition dictionaries 10 mutually hierarchically related as a list of queuing words, storing the list of queuing words in the extracted dictionary and comparing input voice and the list of the stored queuing words, wherein:

when voice is recognized, a dictionary at a low-order 15 hierarchy of recognized voice is extracted and stored as queuing words; and

a queuing word related to the recognized voice out of the queuing words stored when the voice is recognized is stored as an object of comparison in succession.

20 [Detailed Description of invention]

[0001]

[Field of the Invention]

The present invention relates to a voice recognition unit the operability and the responsibility of which 25 are enhanced and a method thereof.

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[0002]

[Related Art]

Heretofore, in case the name of an institution is retrieved using a voice recognition unit, finally the
5   name is vocalized after queuing words are narrowed down based upon a category and a place name as in a procedure for narrowing down shown in Fig. 13 because of securing the ratio of recognition and constraint such as usable memory size. Speech recognition in this case means
10 speech recognition for operation by voice that for example, a car navigation system recognizes user's voice input via a microphone and executes processing for operation using the recognized voice and particularly means speech recognition in which operation for selecting
15 a desired institution out of enormous institution candidates is made by voice. In an initial step, a control command dictionary for operating car navigation is set in the system and a user notifies the system of his/her intention to set a path to a destination
20 by vocalizing a command, "setting a destination".

[0003]

The system is required to retrieve a concrete place to be a destination, however, as the number of institutions is enormous, the concrete place cannot
25 be specified in one speech recognition. Then, to reduce

the number of institutions which are the objects of retrieval, narrowing down based upon a category name is performed. First, for narrowing down based upon a category name, after a category name dictionary is

5 selected as a recognition dictionary, a user is prompted to vocalize a category name as 1) "Please vocalize a category name". In the meantime, when the user vocalizes 2) "Educational institution", a voice recognition unit recognizes the vocalization. The system prompts the

10 user to specify a further detailed subcategory of the category of the educational institution and after a subcategory name dictionary is selected as the recognition dictionary, the user is prompted to vocalize a subcategory name as 3) "Next category name, please".

15 In the meantime, when the user vocalizes 4) "High school", the voice recognition unit recognizes the vocalization.
[0004]

When the subcategory is determined, the system vocalizes 5) "Prefectural name, please" after a

20 prefectural name dictionary is selected as the recognition dictionary to narrow down based upon an area next and prompts the user to narrow down an area in units of a prefectural name. In the meantime, when the user vocalizes 6) Tokyo, the voice recognition unit

25 recognizes the vocalization as Tokyo. In case the

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subcategory is a high school and the prefectural name

is Tokyo, it is determined in the system beforehand

to prompt a user to specify a municipality name and

after a municipality name dictionary is selected as

5   the recognition dictionary, the system prompts the user

to vocalize a municipality name as 7) "Municipality

name, please". In the meantime, when the user vocalizes

8) Shibuya Ward, the voice recognition unit recognizes

the vocalization. As the number of institutions is

10   narrowed down enough when specification is made so far,

the retrieval of the institutional name is started.

[0005]

After the system selects a dictionary of high schools

in Shibuya Ward of Tokyo as the recognition dictionary,

15   it prompts the user to vocalize an institutional name

as 9) "The name, please". When the user vocalizes "School

So-and-So", the voice recognition unit recognizes the

vocalization and sets School So-and-So as a destination.

[0006]

20   [problem to be solved by the invention]

As described above, a troublesome procedure that

the hierarchical structure of speech recognition

dictionaries is sequentially followed and all conditions

for narrowing down are determined is required to be

25   executed. A method of preparing all institutional names

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to be finally retrieved at the upmost hierarchy to avoid the execution of the above-mentioned troublesome procedure exists.

[0007]

5   However, in this case, a memory having enormous capacity is required and there is also a problem that the ratio of recognition is deteriorated and the performance of a response is not satisfactory. For example, as a certain user does not play golf, he/she

10   does not retrieve golf links, however, in case all institutional names including the category in which the user is not interested (in this case, golf links) are prepared, a certain institutional name may be recognized as the name of golf links by mistake. This

15   imposes stress on a user.

<div align="center">SUMMARY OF THE INVENTION</div>

[0008]

     The invention is made in view of the above-mentioned situation and has an object to provide a voice recognition

20   unit and a method thereof the operability of which is improved and the response of which is enhanced respectively by executing a recognition process using a dictionary classified according to at least one narrowing-down condition set by a user beforehand in

25   addition to a dictionary for narrowing down at the upmost

<div align="center">8</div>

hierarchy as objects of recognition.

[0009]

The invention also has an object to provide a voice recognition unit and a method thereof wherein an

5 institutional name matched with the following narrowing-down condition can be retrieved by one vocalization by setting a narrowing-down condition such as a category and an area name frequently used by a user beforehand without troublesome processing that

10 hierarchical structure is sequentially followed and a narrowing-down condition is determined and further, as a narrowing-down condition dictionary is also simultaneously an object of recognition, retrieval is enabled according to a conventional type procedure that

15 hierarchical structure is sequentially followed and a narrowing-down condition is determined even if an institutional name unmatched with a narrowing-down condition set beforehand is required to be retrieved.

[0010]

20 [means for solving the problem]

To achieve the objects, the invention according to a first aspect is provided with plural speech recognition dictionaries mutually hierarchically related, extracting means that extracts a desired

25 dictionary out of the speech recognition dictionaries

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as a list of queuing words, selecting means that selects

a desired dictionary out of the speech recognition

dictionaries, storing means that stores the dictionary

selected by the selecting means as a list of queuing

5   words at a higher-order hierarchy than a preset hierarchy

together with the normal dictionary extracted by the

extracting means and recognizing means that recognizes

input voice by comparing the input voice and the list

of queuing words stored in the storing means.

10   [0011]

The invention according to a second aspect is based

upon the voice recognition unit according to the first

aspect and is characterized in that for a speech

recognition dictionary, a classification dictionary

15   storing the types of institutions and an institution

dictionary storing the names of institutions every type

are provided. Further, the invention according to a

third aspect is based upon the voice recognition unit

according to the first or second aspect and is

20   characterized in that for a speech recognition dictionary,

an area dictionary storing area names and an institution

dictionary storing the names of institutions existing

in any area every area are provided.

[0012]

25   The invention according to a fourth aspect is based

10

upon the voice recognition unit according to the second

or third aspect and is characterized in that selecting

means selects the institution dictionary as a desired

dictionary. Further, the invention according to a fifth

5   aspect is based upon the voice recognition unit according

to the fourth aspect and is characterized in that

extracting means extracts a dictionary at a low-order

hierarchy of recognized voice as queuing words and

extracts a dictionary which belongs to a dictionary

10   selected by selecting means and which is located at

a low-order hierarchy of recognized voice as queuing

words.

[0013]

Owing to the above-mentioned configuration, when

15   a speech recognition dictionary having hierarchical

structure is retrieved, a recognition process is executed

also using a dictionary classified according to at least

one narrowing-down condition set by a user beforehand

as   an   object   of   recognition   together   with   a

20   narrowing-down condition dictionary at the upmost

hierarchy. That is, a voice recognition unit wherein

the name of a target institution matched with the

following narrowing-down condition can be retrieved

by one vocalization without troublesome processing that

25   hierarchical structure is sequentially followed and

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a narrowing-down condition is determined in case a narrowing-down condition frequently used by a user such as a category and an area name is set beforehand can be provided. A voice recognition unit wherein the name

5   of an institution unmatched with a preset narrowing-down condition can be retrieved according to a conventional type procedure that hierarchical structure is sequentially followed and a narrowing-down condition is determined in case the name of the institution

10 unmatched with the preset narrowing-down condition is required to be retrieved because a narrowing-down condition dictionary is also simultaneously an object of recognition can be also provided.

[0014]

15 A voice recognition method according to a sixth aspect is used for a voice recognition unit having plural speech recognition dictionaries mutually hierarchically related and thereby, processing for recognizing input voice is executed using a dictionary

20 classified according to at least one narrowing-down condition set by a user beforehand together with a narrowing-down condition dictionary at the upmost hierarchy as objects of recognition. The invention according to a seventh aspect is based upon the voice

25 recognition method according to the sixth aspect and

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is characterized in that a dictionary classified according to at least one narrowing-down condition set by a user beforehand is a dictionary the frequency of use of which is high.

5 [0015]

Hereby, the operability is improved by executing a recognition process using a dictionary classified according to at least one narrowing-down condition set by a user beforehand together with a narrowing-down

10 condition dictionary at the upmost hierarchy as objects of recognition, the name of a target institution matched with the following narrowing-down condition can be retrieved by one vocalization by setting a narrowing-down condition frequently used by a user such as a category

15 and an area name beforehand without troublesome processing that hierarchical structure is sequentially followed and a narrowing-down condition is determined, and the operability and the responsibility are enhanced.

[0016]

20 The invention according to an eighth aspect is provided with plural speech recognition dictionaries mutually hierarchically related, extracting means that extracts a desired dictionary out of the speech recognition dictionaries as a list of queuing words,

25 storing means that stores the list of queuing words

in the dictionary extracted by the extracting means
and recognizing means that recognizes input voice by
comparing the input voice and the list of queuing words
stored in the storing means and is characterized in

5   that when voice is recognized by the recognizing means,
the extracting means extracts a dictionary at a low-order
hierarchy of recognized voice as queuing words, the
storing means stores it and a queuing word related to
the recognized voice out of the queuing words stored

10   in the storing means when the voice is recognized is
stored as an object of comparison in succession.

[0017]

The invention according to a ninth aspect is based
upon a voice recognition method for recognizing input

15   voice by extracting a desired dictionary out of plural
speech   recognition   dictionaries   mutually
hierarchically related as a list of queuing words,
storing the list of queuing words in the extracted
dictionary and comparing input voice and the stored

20   list of queuing words and is characterized in that when
voice is recognized, a dictionary at a low-order
hierarchy of recognized voice is extracted and stored
as queuing words and a queuing word related to the
recognized voice out of the queuing words stored when

25   the voice is recognized is stored. as an object of

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comparison in succession.

[0018]

[Detailed description of the embodiments of the invention]

5   Fig. 1 is a block diagram showing an embodiment of a voice recognition unit according to the invention.

As shown in Fig. 1, a microphone 100 collects the vocalization of a user, converts it to an electric signal and supplies it to a characteristic value calculating

10   section 101.   The characteristic value calculating section 101 converts pulse code modulation (PCM) data to a characteristic value suitable for speech recognition and supplies it to a recognizing section 102.   The recognizing section 102 calculates similarity between

15   input voice converted to a characteristic value and each queuing word in a recognition dictionary loaded into RAM 103 and outputs n pieces of queuing words higher in similarity and respective similarity (scores) to a control section 107 as a result.

20   [0019]

A recognition dictionary storing section 105 stores plural dictionaries for speech recognition. For the types of dictionaries, there are a narrowing-down condition dictionary and provided every narrowing-down

25   condition and an institutional name dictionary storing

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final place names classified by the combination of narrowing-down conditions, for example concrete institutional names. Further, for the dictionary according to a narrowing-down condition, there are a

5 large area dictionary storing area names showing a large area such as a prefectural name for retrieving a place, a small area dictionary provided every prefecture and storing area names showing a small area such as a municipality name which belongs to each prefecture,

10 a category dictionary storing great classification category names of retrieval places such as the type of an institution and a subcategory dictionary provided every great classification category and storing subcategory names which belong to each great

15 classification category.

[0020]

A recognition dictionary selecting section 104 selects a desired dictionary out of dictionaries stored in the recognition dictionary storing section 105

20 according to an instruction from the control section 107 and loads it into RAM 103 as queuing words. An initial setting section 108 is composed of a remote control key or voice operation means for a user to select so as to set a desired dictionary out of institutional

25 name dictionaries according to the combination of

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narrowing-down conditions as a dictionary at the upmost

hierarchy. An institutional name dictionary set in

the initial setting section 108 is an initial setting

dictionary by a user. A method of setting will be

5   described later. An initial setting storing section

106 stores a narrowing-down condition set by a user

as initial setting via the initial setting section 108

or which institutional name dictionary a user sets as

an initial setting dictionary.

10   [0021]

A voice synthesizing section 109 generates

synthetic voice for a guidance message and an echo and

outputs it to a speaker 112. A retrieving section 111

is provided with databases of map data not shown and

15   others and retrieves the location map, the address,

the telephone number and the service contents of an

institution finally retrieved by speech recognition

from a detailed information database. A result display

section 110 is a display for displaying detailed

20   information retrieved by the retrieving section 111

together with the result of recognition in voice

operation, queuing words, a guidance message and an

echo.

[0022]

25   The control section 107 controls each component

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according to the result of output outputted from the above-mentioned each component. That is, the control section 107 controls so that the recognition dictionary selecting section 104 first extracts a category

5 dictionary from the recognition dictionary storing section 105 when the retrieval of an institution by speech recognition is made and sets the extracted category dictionary in RAM 103 as queuing words. At this time, the control section controls so that a

10 narrowing-down condition or an institutional name dictionary set by a user beforehand is recognized by referring to the initial setting storing section 106, the recognition dictionary selecting section 104 similarly extracts the corresponding narrowing-down

15 condition or the corresponding institutional name dictionary from the recognition dictionary storing setting 105 and sets it in RAM 103 as queuing words.
[0023]

The voice synthesizing section 109 is instructed

20 to generate a guidance message, "Please vocalize a category name" for example and to output it from the speaker 112.
[0024]

When a queuing word in a category dictionary stored

25 in RAM 103 as queuing words is input in voice, a dictionary

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of a subcategory which belongs to a category shown by input voice is read from the recognition dictionary storing section 105 and is loaded into RAM 103 to be the next queuing word. When a queuing word in the

5 subcategory dictionary stored in RAM 103 as queuing words is input in voice, the subcategory shown by input voice is stored, a large area dictionary related to the subcategory is read from the recognition dictionary storing section 105 and is loaded into RAM 103 to be

10 the next queuing word.

[0025]

When a queuing word in the large area dictionary stored in RAM 103 as queuing words is input in voice, a dictionary of a small area which belongs to the input

15 large area is read from the recognition dictionary storing section 105 and is loaded into RAM 103 to be the next queuing word. When a queuing word in the small area dictionary stored in RAM 103 as queuing words is input in voice, the small area shown by input voice

20 is stored, a dictionary showing a concrete one place related to the small area is read from the recognition dictionary storing section 105 and is loaded into RAM 103 to be the next queuing word. As described above, a dictionary composed of queuing words is hierarchically

25 stored in the recognition dictionary storing section

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105 so that it is sequentially changed and is hierarchically used. That is, as shown as a hierarchical dictionary tree in Figs. 2 to 5 described later, a subcategory dictionary is located under a category

5 dictionary, a small area dictionary is located under a large area dictionary and plural dictionaries showing a concrete one place exist at the bottom hierarchy.

[0026]

Figs. 2 to 12 are explanatory drawings for explaining

10 the operation of this embodiment of the invention shown in Fig. 1, Figs. 2 to 5 show a hierarchical dictionary tree of speech recognition dictionaries having hierarchical structure, Figs. 6 to 8 are flowcharts showing the operation and Figs. 9 to 12 show the

15 configuration of a screen for the initial setting of a narrowing-down condition.

[0027]

The invention is characterized in that in retrieving a speech recognition dictionary having hierarchical

20 structure, a recognition process is also applied to one or plural institutional name dictionaries set by a user beforehand (dictionaries classified according to a narrowing-down condition and equivalent to a dictionary of hospitals and a dictionary of

25 accommodations in the hierarchical dictionary tree shown

20

in Fig. 3) together with a first narrowing-down condition dictionary (a category name dictionary in the hierarchical dictionary tree shown in Fig. 3) at a first hierarchy as an object of recognition.

5   [0028]

That is, if a user sets a narrowing-down condition such as a category and an area name respectively frequently used by a user beforehand, an institutional name to be a target which is matched with the

10 narrowing-down condition can be retrieved by one vocalization without troublesome processing that hierarchical structure is sequentially followed and a narrowing-down condition is determined. As a narrowing-down condition dictionary is also

15 simultaneously an object of recognition, even an institutional name which is not matched with the narrowing-down condition set beforehand can be retrieved according to a conventional type procedure that hierarchical structure is sequentially followed and

20 a narrowing-down condition is determined.
[0029]

It is desirable that the number or the size of institutional name dictionaries (dictionaries classified according to a narrowing-down condition)

25 which can be set beforehand is set by a system designer

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beforehand from the viewpoint of the ratio of recognition

and because of the limit of usable memory capacity.

[0030]

In a recognition process at a first hierarchy, even

5 if a word in a category name dictionary is recognized,

a dictionary (a dictionary of accommodations in the

hierarchical dictionary tree shown in Fig. 5) matched

with a narrowing-down condition and including a queuing

word related to recognized voice out of queuing words

10 stored as the queuing words in a dictionary being an

object of recognition in recognition such as an

institutional name dictionary (a dictionary classified

according to the narrowing-down condition and equivalent

to a dictionary of hospitals and a dictionary of

15 accommodations in the hierarchical dictionary tree shown

in Fig. 5) set by a user beforehand and shown in the

hierarchical dictionary tree in Fig. 5 may be also an

object of recognition together with the subcategory

name dictionary. A recognition process at a third or

20 the succeeding hierarchy is also similar.

[0031]

Referring to the drawings, the recognition process

will be described in detail below. First, according

to the hierarchical dictionary tree shown in Fig. 2,

25 communication between a system and a user is as follows.

(1) The system: "Please vocalize a command"

(2) The user : "Hospital"

(3) The system: "Next category, please"

(4) The user : "Clinic"

5   (5) The system: "Prefectural name, please"

(6) The user : "Saitama Prefecture"

(7) The system: "Municipality name, please"

(8) The user : "Kawagoe City"

(9) The system: "The name, please"

10   (10) The user : "Dr. Kurita's office"

That is, in this case, speech recognition is made
with a dictionary of hospitals (clinics) in Kawagoe
City of Saitama Prefecture 204 as an object of recognition
for input voice, "Dr. Kurita's office".

15   [0032]

In the meantime, communication between the system
and a user in case the user sets a hospital 302 and
accommodations 303 beforehand, which is the
characteristic of the invention as shown in the

20   hierarchical dictionary tree in Fig. 3 and in case the
name of an institution matched with the set
narrowing-down conditions is retrieved is as follows.

(1) The system: "Please vocalize a category name
or an institutional name"

25   (2) The user : "Dr. Saito's office"

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[0033]

In this case, speech recognition is made with a category name dictionary 301, a dictionary of hospitals 302 and a dictionary of accommodations 303 as an object

5   of recognition for input voice, "Dr. Saito's office". As the object (Dr. Saito's office) is included in the dictionary of hospitals 302 in this case, retrieval processing is finished by one vocalization. The dictionary of hospitals 302 is a set of dictionaries

10 (307, 308, ---, 313) of names which belong to all subcategories of hospitals in all municipalities of all prefectures and the dictionary of accommodations 303 is also similar.

[0034]

15 In the meantime, communication between the system and a user in case the name of an institution not matched with a set narrowing-down condition is retrieved as shown in the hierarchical dictionary tree in Fig. 4 and in case only a narrowing-down condition dictionary

20 is an object of recognition at a second or the succeeding hierarchy is as follows.

(1) The system: "Please vocalize a category name or an institutional name"

(2) The user : "Station name"

25 (3) The system: "Subcategory name, please"

24

(4) The user : "Private railroad"

(5) The system: "Prefectural name, please"

(6) The user : "Saitama Prefecture"

(7) The system: "Municipality name, please"

5   (8) The user : "Kumagaya City"

(9) The system: "Station name, please"

(10) The user : "Ishiwara Station"

[0035]

In this case, speech recognition is made with a

10 dictionary of station names (of private railroads) in

Kumagaya City of Saitama Prefecture 408 as an object

of recognition for input voice, "Ishiwara Station".

As the object (Ishiwara Station) is not included in

first hierarchy queuing dictionaries 400, the user

15 vocalizes a category name included in a category name

dictionary 401 at a first hierarchy and afterward,

retrieval processing is executed according to a

conventional type method.

[0036]

20   Next, a case that the name of an institution matched

with a set narrowing-down condition is retrieved and

institutional name dictionaries matched with a

narrowing-down condition set beforehand together with

the set narrowing-down condition and a narrowing-down

25 condition determined in a process of retrieval is an

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object of recognition at a second or the succeeding hierarchy will be described referring to Fig. 5. In this case, communication between the system and a user is as follows.

5   (1) The system: "Please vocalize a category name or an institutional name"

(2) The user : "Accommodations"

(3) The system: "Subcategory name or institutional name, please"

10   (4) The user : "Kobayashi Hotel"

[0037]

In this case, speech recognition is made with a subcategory name dictionary of accommodations 505 and a dictionary of accommodations 503 as objects of

15 recognition for input voice, "Kobayashi Hotel". As the object (Kobayashi Hotel) is included in the dictionary of accommodations 503, retrieval processing is finished at this time.

[0038]

20   Institutional name dictionaries matched with the narrowing-down condition set beforehand together with the narrowing-down condition dictionary and the narrowing-down condition determined in the process of retrieval are objects of recognition at the second or

25 the succeeding hierarchy. For example,

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(1) The system: "Please vocalize a category name or an institutional name"

(2) The user : "Accommodations"

(3) The system: "Subcategory name or institutional

5 name, please"

(4) The user : "Japanese-style hotel"

(5) The system: "Prefectural name or institutional name, please"

(6) The user : "Kobayashi Hotel"

10 [0039]

Communication between the system and a user in case the name of an institution not matched with a preset narrowing-down condition is retrieved is as follows.

(1) The system: "Please vocalize a category name

15 or an institutional name"

(2) The user : "Station name"

(3) The system: "Subcategory name, please" (*)

(4) The user : "JR"

(5) The system: "Prefectural name, please" (*)

20 (6) The user : "Saitama Prefecture"

(7) The system: "Municipality name, please" (*)

(8) The user : "Kumagaya City"

(9) The system: "Station name, please"

(10) The user : "Kumagaya Station"

25 [0040]

27

In this case, speech recognition is made with a dictionary of station names (of JR) in Kumagaya City of Saitama Prefecture as an object of recognition for input voice, "Kumagaya Station". As no institution

5   matched with the preset narrowing-down condition and all narrowing-down conditions determined in a process of retrieval exists, an institutional name is not included in the guidance of the system in items to which the mark * is added in the above-mentioned communication

10 between the system and the user.

[0041]

Fig. 6 is a flowchart showing a procedure for development in hierarchies in the hierarchical dictionary tree shown in Fig. 3. Referring to the

15 hierarchical dictionary tree shown in Fig. 3 and the flowchart shown in Fig. 6, the operation of the embodiment of the invention shown in Fig. 1 will be described below.

[0042]

First, a user sets a narrowing-down condition by

20 the initial setting section 108 in a step S600. As its initial set value is stored in the initial setting storing section 106, this processing has only to be executed once at initial time and is not required to be executed every retrieval. In a step S601, it is

25 judged whether the initiation of retrieval is triggered

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by a vocalization button and others or not and in case
it is not triggered, control is returned to the step
S601.

[0043]

5   In the meantime, in case the initiation of retrieval
is triggered, control proceeds to processing in a step
S602, and the category name dictionary 301 and one or
plural institutional name dictionaries stored in the
initial setting storing section 106 and matched with
10   the condition set by the user beforehand are loaded
into RAM 103. In a step S603, a recognition process
is executed using the dictionaries loaded into RAM 103
as objects of recognition. At this time, the user
vocalizes a category name or an institutional name
15   matched with the condition set beforehand.

[0044]

In a step S604, in case the result of recognition
in the step S603 is the institutional name, control
is transferred to processing in a step S613, the result
20   is displayed by the result display section 110,
text-to-speech (TTS) output is made and retrieval
processing is executed by the retrieving section 111.

In case the result of recognition is not an institutional
name in the step S604, control is transferred to
25   processing in a step S605 and a subcategory name

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dictionary in the category of the result of recognition is loaded into RAM 103. In a step S606, a recognition process is executed using the dictionary corresponding to a subcategory name vocalized by the user and loaded

5   into RAM 103 as an object of recognition.

[0045]

In a step S607, a prefectural name dictionary is loaded into RAM 103 and in a step S608, a recognition process is executed using the dictionary corresponding

10 to a prefectural name vocalized by the user and loaded into RAM 103 as an object of recognition. In a step S609, a municipality name dictionary of a prefecture as the result of recognition in the step S608 is loaded into RAM 103 and a recognition process is executed using

15 the dictionary corresponding to a municipality name vocalized by the user in a step S610 and loaded into RAM 103 as an object of recognition.

[0046]

In a step S611, institutional name dictionaries

20 matched with conditions acquired as the result of recognition in the steps S603, S606, S608 and S610 are loaded into RAM 103 and a recognition process is executed using the dictionary corresponding to an institutional name vocalized by the user in a step S612 and loaded

25 into RAM 103 as an object of recognition. Finally,

30

in a step S613, the result is displayed by he result

display section 110, TTS output is made and retrieval

processing is executed by the retrieving section 111.

[0047]

5   Fig. 7 is a flowchart showing a procedure for

development   in   hierarchies   in   the   hierarchical

dictionary tree shown in Fig. 5.   Referring to the

hierarchical dictionary tree shown in Fig. 5 and the

flowchart shown in Fig. 7, the operation of the embodiment

10   of the invention shown in Fig. 1 will be described below.

[0048]

       First, a user sets a narrowing-down condition via

the initial setting section 108 in a step S700. As

its initial set value is stored in the initial setting

15   storing section 106, this processing has only to be

executed once at initial setting time and is not required

to be executed every retrieval.   In a step S701, it

is judged whether the initiation of retrieval is

triggered by a vocalization button and others or not

20   and in case it is not triggered, control is returned

to processing in the step S701. When the initiation

of retrieval is triggered, control is transferred to

processing in a step S702, and the category name

dictionary and one or plural institutional name

25   dictionaries stored in the initial setting storing

31

section 106 and matched with the condition set by the

user beforehand are loaded into RAM 103. In a step

S703, a recognition process is executed using the

dictionary loaded into RAM 103 as an object of recognition.

5   At this time, the user vocalizes a category name or

an institutional name matched with the condition set

beforehand.

[0049]

    In a step S704, in case the result of recognition

10   in the step S703 is the institutional name, control

is transferred to processing in a step S716. In case

the result of recognition is not the institutional name,

control is transferred to processing in a step S705,

the subcategory name dictionary in the category of the

15   result of recognition and an institutional name

dictionary matched with both the condition set beforehand

and a condition acquired as a result of recognition

in the step S703 are loaded into RAM 103 and a recognition

process is executed using the dictionary corresponding

20   to the subcategory name or the institutional name

vocalized by the user in the step S706 and loaded into

RAM 103 as an object of recognition.

[0050]

    In a step S707, in case the result of recognition

25   in the step S706 is the institutional name, control

32

is transferred to the processing in the step S716.
In case the result of recognition is not the institutional
name, control is transferred to processing in a step
S708, the prefectural name dictionary and an
5   institutional name dictionary matched with the condition
set beforehand and all conditions acquired as a result
of recognition in the steps S703 and S706 are loaded
into RAM 103 and a recognition process is executed using
the dictionary corresponding to a prefectural name or
10   an institutional name vocalized by the user in a step
S709 and loaded into RAM 103 as an object of recognition.
[0051]

In a step S710, in case the result of recognition
in the step S709 is the institutional name, control
15   is transferred to the processing in the step S716.
In case the result of recognition is not the institutional
name, control is transferred to processing in a step
S711, a municipality name dictionary of a prefecture
as a result of recognition in the step S709 and an
20   institutional name dictionary matched with the condition
set beforehand and all conditions acquired as a result
of recognition in the steps S703, S706 and S709 are
loaded into RAM 103 and a recognition process is executed
using the dictionary corresponding to a municipality
25   name or an institutional name vocalized by the user

33

in a step S712 and loaded into RAM 103 as an object
of recognition.

[0052]

In a step S713, in case the result of recognition

5   in the step S712 is the institutional name, control
is transferred to the processing in the step S716.
In case the result of recognition is not the institutional
name, control is transferred to processing in a step
S714. An institutional name dictionary matched with

10 all conditions acquired as a result of recognition in
the steps S703, S706, S709 and S712 is loaded into RAM
103 and a recognition process is executed using the
dictionary corresponding to an institutional name
vocalized by the user in a step S715 and loaded into

15 RAM 103 as an object of recognition. Finally, in the
step S716, the result is displayed, TTS output is made
and retrieval processing is executed.

[0053]

Fig. 8 is a flowchart showing the detailed procedure

20 of a recognition process shown in Figs. 6 and 7 (in
the steps S603, S606, S608, S610, S612, S703, S706,
S709, S712 and S715).

[0054]

Referring to the flowchart shown in Fig. 8, a

25 recognition process executed in the above-mentioned

34

each step will be described below. First, in a step
S800, it is detected whether input from the microphone
100 includes voice or not. For a method of detection,
there is a method of regarding as voice in case power
5　exceeds a certain threshold. The detection of voice
is judged as the initiation of voice, in a step S801
the characteristic value is calculated by the
characteristic value calculating section 101 and in
a step S802, similarity between each word included in
10　a recognition dictionary loaded into RAM 103 and a
characteristic value calculated based upon input voice
is calculated. In a step S803, in case the voice is
not finished, control is returned to the processing
in the step S801. In case the voice is finished, a
15　word the similarity of which is the highest is output
as a result of recognition in a step S804.

[0055]

Finally, for a method of the initial setting of
a narrowing-down condition, two cases of a case using
20　a remote control and a case by speech recognition will
be described.

[0056]

In case a remote control is used, an item of
narrowing-down condition setting change is first
25　selected on a menu screen displayed by pressing a menu

35

button of the remote control. Hereby, a narrowing-down

condition setting change screen shown in Fig. 9 is

displayed. On the narrowing-down condition setting

change screen, a group of institutional name dictionaries

5 classified according to a narrowing-down condition (a

prefectural name and a category name) is allocated and

arranged in a matrix. In this case, a cursor is moved

to a condition name for the setting to be changed by

a joy stick of the remote control.

10 [0057]

For example, a desired prefecture in a list of

prefectures is selected by moving the joy stick in a

transverse direction as shown in Fig. 10. In case a

determination button of the remote control is pressed

15 when Saitama Prefecture is selected for example, a

condition in the position of the cursor (institutional

name dictionaries in all categories existing in Saitama

Prefecture) becomes a narrowing-down condition.

[0058]

20 Also, a desired category in a list of category names

is selected by moving the joy stick in a longitudinal

direction as shown in Fig. 11. In case the determination

button is pressed when hospitals are selected for example,

a condition in the position of the cursor (hospital

25 name dictionaries all over the country) becomes a

36

narrowing-down condition. Further, when hospitals are selected as shown in Fig. 11 after Saitama Prefecture is selected on a display screen shown in Fig. 10, a hospital name dictionary of Saitama Prefecture is

5   narrowed down as shown in Fig. 12.

[0059]

In this case, the name dictionary selected in case "Saitama Prefecture" and "hospital" are set for an initial set value is shown, however, it is not essential

10   to set both a prefectural name and a hospital name and each may be also set independently. Also, in case it is set beforehand that a condition in a position where the determination button is pressed becomes a narrowing-down condition, the setting is to be released.

15   That is, in case the above-mentioned condition becomes a narrowing-down condition, the setting is released and in case the above-mentioned condition does not become a narrowing-down condition, the setting is changed so that the condition becomes a narrowing-down condition.

20   Further, the case that a narrowing-down condition is selected by the joy stick is described above, however, in place of the joy stick, a touch panel may be also used.

[0060]

25   A case that the initial setting of a narrowing-down

37

condition is made by speech recognition will be described below. A word meaning narrowing-down condition changing processing such as the change of setting is also added to a queuing dictionary at a first hierarchy

5   of speech recognition and in case the word is recognized, narrowing-down condition setting changing processing is started. First, in setting changing processing, a speech recognition process is executed using a dictionary having narrowing-down condition names as

10 queuing words, in case a recognized condition is turned on, it is turned off and in case it is turned off, the setting is changed so that the condition is turned on. [0061]

Next, in the setting changing processing, a speech

15 recognition process is executed using a dictionary having a queuing word to which turning on or turning off is added after each narrowing-down condition name, in case a recognized word includes turning on a condition name, the condition is turned on and in case the recognized

20 word includes turning off a condition name, the condition is turned off. In the above-mentioned setting changing processing, continuous recognition using syntax that (a condition name) + (a word specifying turning on or turning off) may be also made.

25 [0062]

As described above, according to the invention, the operability is improved and the responsibility is also enhanced respectively by executing a recognition process using a dictionary classified according to at

5   least one narrowing-down condition set by a user beforehand in addition to a narrowing-down condition dictionary at the upmost hierarchy as objects of recognition.

[0063]

10   [Effect of the invention]

As described above, the voice recognition method according to the invention is used for the voice recognition unit having plural speech recognition dictionaries having hierarchical structure, the

15   improvement of the operability and the enhancement of the responsibility are made by executing a recognition process using a dictionary classified according to at least one narrowing-down condition set by a user beforehand together with the narrowing-down condition

20   dictionary at the upmost hierarchy as objects of recognition and the name of a target institution matched with the following narrowing-down condition can be retrieved by one vocalization by setting a narrowing-down condition frequently used by a user such as a category

25   and an area name beforehand without troublesome

processing that hierarchical structure is sequentially followed and a narrowing-down condition is determined.

[0064]

Also, according to the invention, in case an

5 institutional name unmatched with a narrowing-down condition set beforehand is retrieved, the conventional type procedure that a narrowing-down condition is sequentially determined can be taken. Further, in case an institutional name matched with a narrowing-down

10 condition set beforehand is retrieved, processing for recognizing the institutional name can be also executed using one dictionary set finally matched with the narrowing-down condition after a narrowing-down condition is sequentially determined according to the

15 conventional type procedure.

[Brief description of the drawings]

[Fig. 1]

Fig. 1 is a block diagram showing an embodiment of a voice recognition unit according to the invention;

20 [Fig. 2]

Fig. 2 is an explanatory drawing for explaining a voice recognition method according to the invention and shows an example of a hierarchical dictionary tree;

[Fig. 3]

25 Fig. 3 is an explanatory drawing for explaining

40

the voice recognition method according to the invention

and shows an example of a hierarchical dictionary tree;

[Fig. 4]

Fig. 4 is an explanatory drawing for explaining

5 the voice recognition method according to the invention

and shows an example of a hierarchical dictionary tree;

[Fig. 5]

Fig. 5 is an explanatory drawing for explaining

the voice recognition method according to the invention

10 and shows an example of a hierarchical dictionary tree;

[Fig. 6]

Fig. 6 is a flowchart showing a procedure for

following hierarchies in the hierarchical dictionary

tree shown in Fig. 3;

15 [Fig. 7]

Fig. 7 is a flowchart showing a procedure for

following hierarchies in the hierarchical dictionary

tree shown in Fig. 5;

[Fig. 8]

20 Fig. 8 is a flowchart showing the details of the

procedures for a recognition process shown in Figs.

6 and 7;

[Fig. 9]

Fig. 9 shows the initial setting method of a

25 narrowing-down condition on a display screen;

41

[Fig. 10]

Fig. 10 shows the initial setting method of a narrowing-down condition on the display screen;

[Fig. 11]

5   Fig. 11 shows the initial setting method of a narrowing-down condition on the display screen;

[Fig. 12]

Fig. 12 shows the initial setting method of a narrowing-down condition on the display screen; and

10   [Fig. 13]

Fig. 13 is an explanatory drawing for explaining a conventional type procedure for narrowing down.

[Explanation of symbol]

100. MICROPHONE, 101. CHARACTERISTIC VALUE CALCULATING

15   SECTION, 102. RECOGNIZING SECTION, 103. RAM, 104. RECOGNITION DICTIONARY SELECTING SECTION, 105. RECOGNITION DICTIONARY STORING SECTION, 106. INITIAL SETTING STORING SECTION, 107. CONTROL SECTION, 108. INITIAL SETTING SECTION, 109. VOICE SYNTHESIZING SECTION

20   110. RESULT DISPLAY SECTION, 111. RETRIEVING SECTION, 112. SPEAKER

42

[Document name] Abstract

[Summary]

[Problem]

The invention has an object to avoid the execution

5   of a troublesome procedure that the hierarchical

structure of speech recognition dictionaries having

hierarchical structure is sequentially followed and

all narrowing-down conditions are determined when an

institutional name and others are retrieved and to

10 enhance the operability and the responsibility.

[means to solve]

A voice recognition unit according to the invention

is composed of plural speech recognition dictionaries

(a recognition dictionary storing section) having

15 hierarchical structure, extracting means (a control

section) that extracts a desired dictionary out of the

speech recognition dictionaries as a list of queuing

words, selecting means (a recognition dictionary

selecting section) that selects a desired dictionary,

20 storing means (RAM) that stores the dictionary selected

by the selecting means as a list of queuing words at

the upmost hierarchy together with the normal dictionary

extracted by the extracting means and recognizing means

(a recognizing section) that recognizes input voice

25 by comparing the input voice and the list of queuing

43

words stored in the storing means.

[selected drawing] FIG. 1

【書類名】　　　図面　Drawings
Document Nau
【図１】

FIG. 1

- 100 マイク
- 101 特徴量計算部
- 102 認識部
- 103 RAM
- 104 認識辞書選択部
- 105 認識辞書記憶部
- 106 初期設定記憶部
- 107 制御部
- 108 初期設定部
- 109 音声合成部
- 110 結果表示部
- 111 検索部
- 112 スピーカ
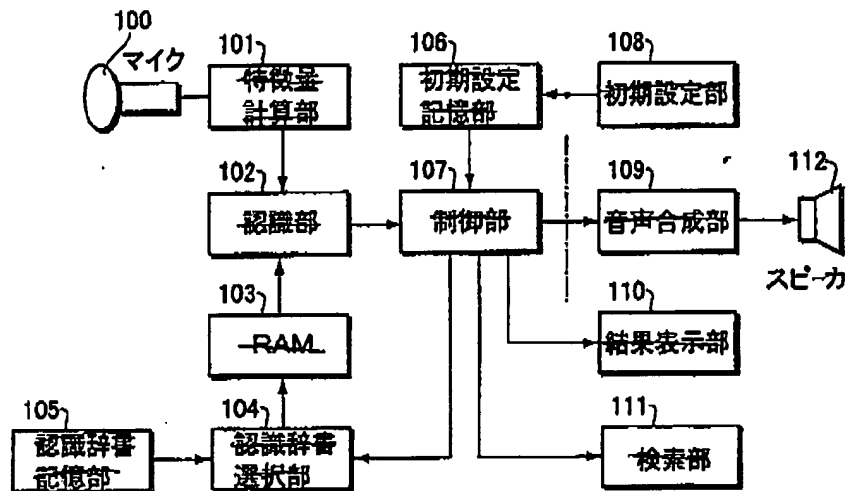
DRAWINGS

[FIG. 1]

100. MICROPHONE

101. CHARACTERISTIC VALUE CALCULATING SECTION

5 102. RECOGNIZING SECTION

104. RECOGNITION DICTIONARY SELECTING SECTION

105. RECOGNITION DICTIONARY STORING SECTION

106. INITIAL SETTING STORING SECTION

107. CONTROL SECTION

10 108. INITIAL SETTING SECTION

109. VOICE SYNTHESIZING SECTION

110. RESULT DISPLAY SECTION

111. RETRIEVING SECTION

112. SPEAKER

整理番号＝５４Ｐ０６３２　　　特願2000-267954　　　提出日　平成１２年　９月　５日　　　頁：　2/　13

【図2】　　　　　　　　　FIG.2
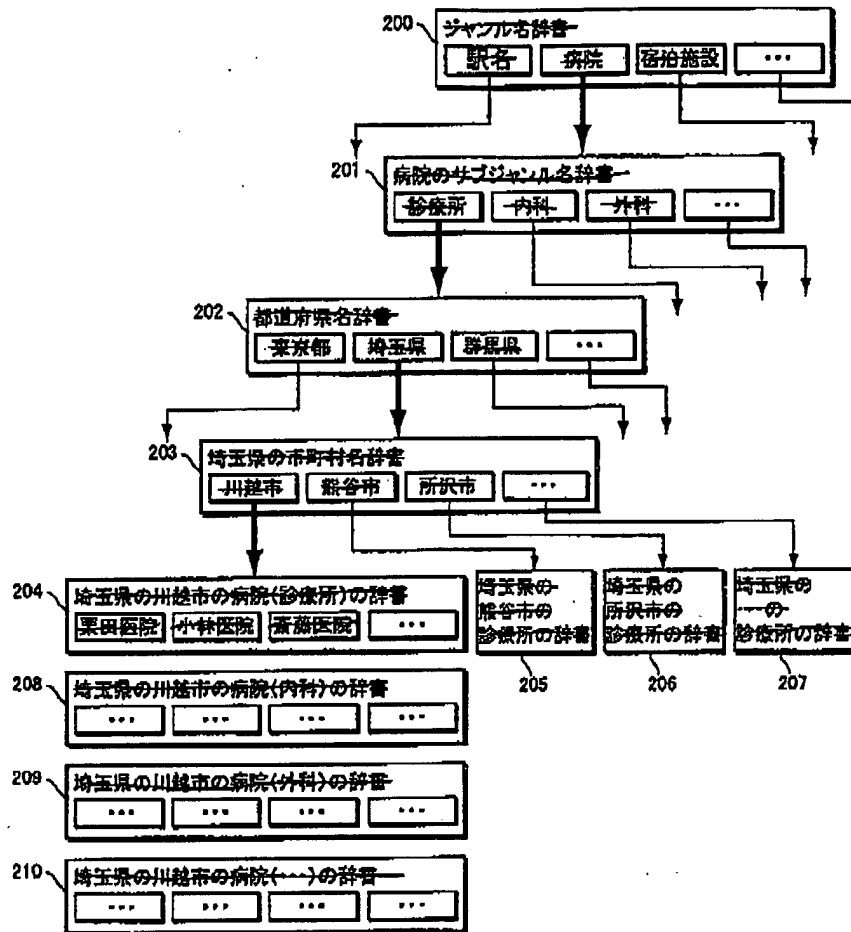
[FIG. 2]

200,

CATEGORY NAME DICTIONARY

STATION NAME, HOSPITAL, ACCOMMODATIONS

5　201,

HOSPITAL SUBCATEGORY NAME DICTIONARY

CLINIC, INTERNAL DEPARTMENT, SURGICAL DEPARTMENT

202

PREFECTURAL NAME DICTIONARY METROPOLIS OF TOKYO, SAITAMA

10　, PREFECTURE, GUNMA PREFECTURE

203 SAITAMA PREFECTURE MUNICIPALITY NAME DICTIONARY

KAWAGOE CITY, KUMAGAYA CITY, TOKOROZAWA CITY

204 SAITAMA PREFECTURE KAWAGOE CITY HOSPITAL (CLINIC)

DICTIONARY, DR. KURITA'S OFFICE, DR. KOBAYASHI'S OFFICE,

15　DR. SAITO'S OFFICE

205 SAITAMA PREFECTURE KUMAGAYA CITY CLINIC DICTIONARY

206 SAITAMA PREFECTURE TOKOROZAWA CITY CLINIC DICTIONARY

207 SAITAMA PREFECTURE SOMEWHERE CLINIC DICTIONARY

208 SAITAMA PREFECTURE KAWAGOE CITY HOSPITAL (INTERNAL

20　DEPARTMENT) DICTIONARY

209 SAITAMA PREFECTURE KAWAGOE CITY HOSPITAL (SURGICAL

DEPARTMENT) DICTIONARY

210 SAITAMA PREFECTURE KAWAGOE CITY HOSPITAL (SO-AND-SO)

DICTIONARY

46

【図3】 FIG.3

[FIG. 3]

301 CATEGORY NAME DICTIONARY STATION NAME, HOSPITAL,
ACCOMMODATIONS

302 HOSPITAL DICTIONARY

5   303 ACCOMMODATIONS DICTIONARY

304 HOSPITAL SUBCATEGORY NAME DICTIONARY

CLINIC, INTERNAL DEPARTMENT, SURGICAL DEPARTMENT

305 PREFECTURAL NAME DICTIONARY METROPOLIS OF TOKYO,

SAITAMA PREFECTURE, GUNMA PREFECTURE

10   306 SAITAMA PREFECTURE MUNICIPALITY NAME DICTIONARY

KAWAGOE CITY, KUMAGAYA CITY, TOKOROZAWA CITY

307 SAITAMA PREFECTURE KAWAGOE CITY HOSPITAL (CLINIC)

DICTIONARY, DR. KURITA'S OFFICE, DR. KOBAYASHI'S OFFICE,

DR. SAITO'S OFFICE

15   308 SAITAMA PREFECTURE KUMAGAYA CITY CLINIC DICTIONARY

309 SAITAMA PREFECTURE TOKOROZAWA CITY CLINIC DICTIONARY

310 SAITAMA PREFECTURE SOMEWHERE CLINIC DICTIONARY

311 SAITAMA PREFECTURE KAWAGOE CITY HOSPITAL (INTERNAL

DEPARTMENT) DICTIONARY

20   312 SAITAMA PREFECTURE KAWAGOE CITY HOSPITAL (SURGICAL

DEPARTMENT) DICTIONARY

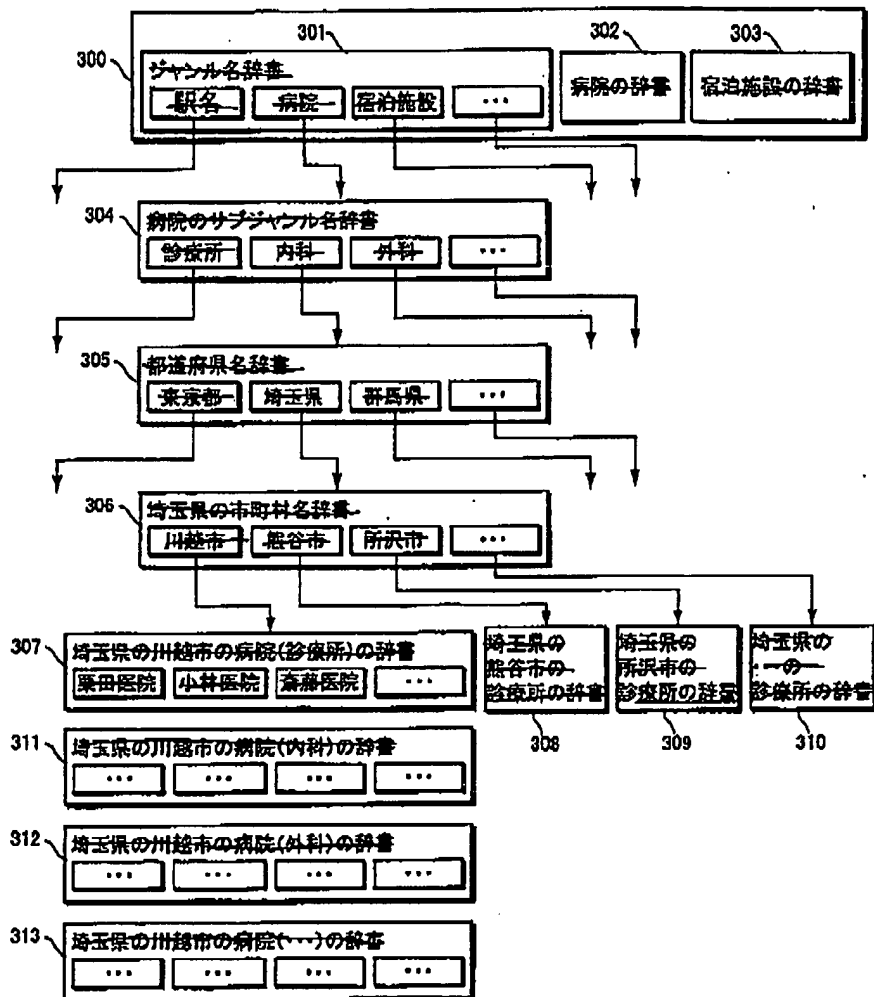313 SAITAMA PREFECTURE KAWAGOE CITY HOSPITAL (SO-AND-SO)

DICTIONARY

【図4】　　　　　　　　　　　　FIG. 4

[FIG. 4]

401 CATEGORY NAME DICTIONARY STATION NAME, HOSPITAL, ACCOMMODATIONS

402 HOSPITAL DICTIONARY

5   403 ACCOMMODATIONS DICTIONARY

404. STATION NAME SUBCATEGORY NAME DICTIONARY

JR, PRIVATE RAILROAD, SUBWAY

405 PREFECTURAL NAME DICTIONARY METROPOLIS OF TOKYO, SAITAMA PREFECTURE, GUNMA PREFECTURE

10   406 SAITAMA PREFECTURE MUNICIPALITY NAME DICTIONARY KAWAGOE CITY, KUMAGAYA CITY, TOKOROZAWA CITY

407. SAITAMA PREFECTURE KAWAGOE CITY PRIVATE RAILROAD DICTIONARY

408. SAITAMA PREFECTURE KUMAGAYA CITY STATION NAME

15   (PRIVATE RAILROAD) DICTIONARY KUMAGAYA STATION, KAMIKUMAGAYA STATION, ISHIWARA STATION

409. SAITAMA PREFECTURE TOKOROZAWA CITY PRIVATE RAILROAD DICTIONARY

410. SAITAMA PREFECTURE SOMEWHERE PRIVATE RAILROAD

20   DICTIONARY

411. SAITAMA PREFECTURE KUMAGAYA CITY STATION NAME (JR) DICTIONARY

412. SAITAMA PREFECTURE KUMAGAYA CITY STATION NAME (SUBWAY) DICTIONARY

25   413. SAITAMA PREFECTURE KUMAGAYA CITY STATION NAME

48

(SO-AND-SO) DICTIONARY
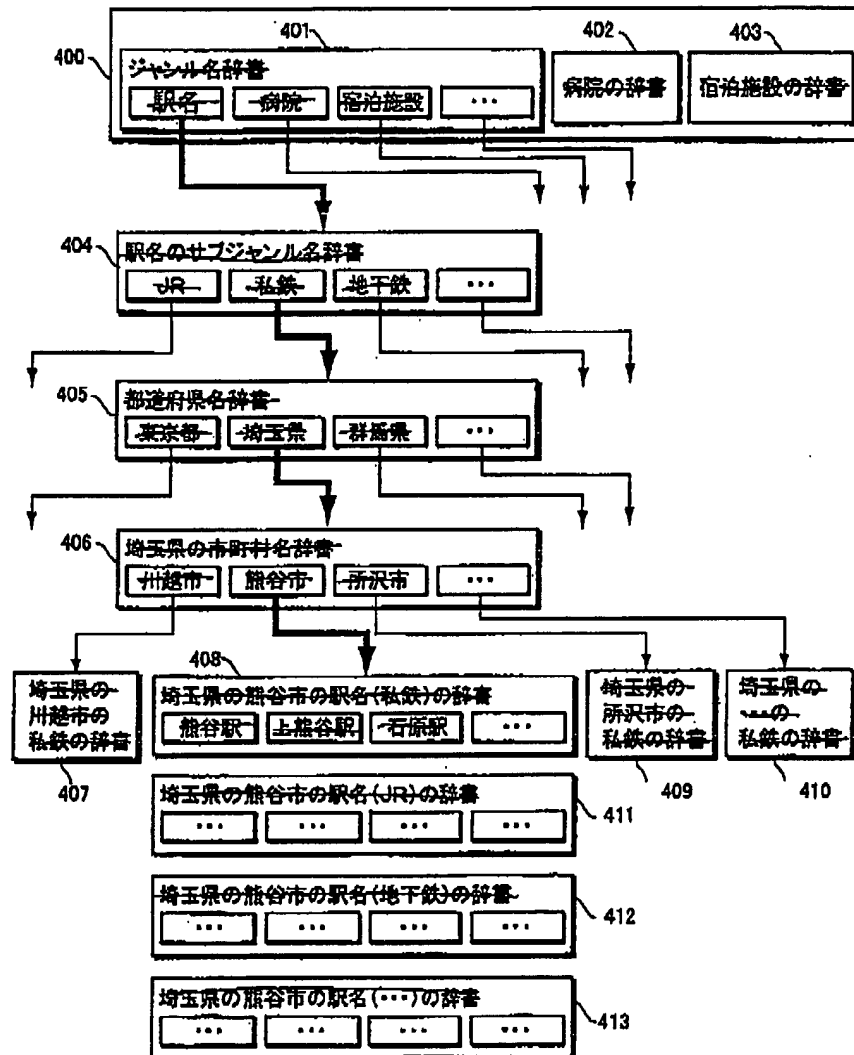
【図５】　FIG.5
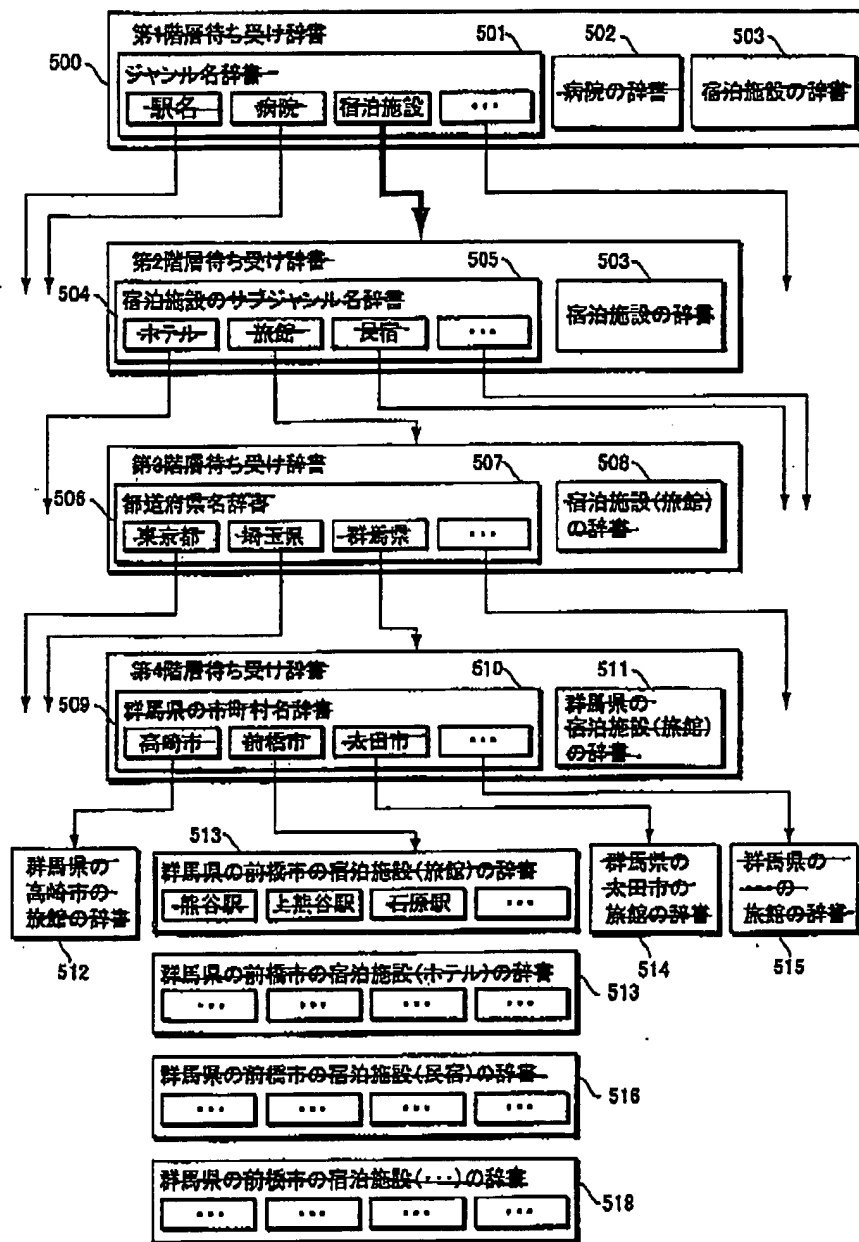
[FIG. 5]

500. FIRST HIERARCHY QUEUING DICTIONARIES

501 CATEGORY NAME DICTIONARY STATION NAME, HOSPITAL, ACCOMMODATIONS

5 502 HOSPITAL DICTIONARY

503 ACCOMMODATIONS DICTIONARY

504. SECOND HIERARCHY QUEUING DICTIONARIES

505. ACCOMMODATIONS SUBCATEGORY NAME DICTIONARY

HOTEL, JAPANESE-STYLE HOTEL, PRIVATE HOUSE PROVIDING

10 BED AND MEALS

506. THIRD HIERARCHY QUEUING DICTIONARIES

508. ACCOMMODATIONS (JAPANESE-STYLE HOTEL) DICTIONARY

507 PREFECTURAL NAME DICTIONARY METROPOLIS OF TOKYO,

SAITAMA PREFECTURE, GUNMA PREFECTURE

15 509. FOURTH HIERARCHY QUEUING DICTIONARIES

510. GUNMA PREFECTURE MUNICIPALITY NAME DICTIONARY

TAKASAKI CITY, MAEBASHI CITY, OTA CITY

511. GUNMA PREFECTURE ACCOMMODATIONS (JAPANESE-STYLE

HOTEL) DICTIONARY

20 512. GUNMA PREFECTURE TAKASAKI CITY JAPANESE-STYLE HOTEL

DICTIONARY

513. GUNMA PREFECTURE MAEBASHI CITY ACCOMMODATIONS

(JAPANESE-STYLE HOTEL) DICTIONARY

KUMAGAYA STATION, KAMIKUMAGAYA STATION, ISHIWARA

25 STATION

50

513. GUNMA PREFECTURE MAEBASHI CITY ACCOMMODATIONS (HOTEL) DICTIONARY

514. GUNMA PREFECTURE OTA CITY JAPANESE-STYLE HOTEL DICTIONARY

5 515. GUNMA PREFECTURE SOMEWHERE JAPANESE-STYLE HOTEL DICTIONARY

516. GUNMA PREFECTURE MAEBASHI CITY ACCOMMODATIONS (PRIVATE HOUSE PROVIDING BED AND MEALS) DICTIONARY

518. GUNMA PREFECTURE MAEBASHI CITY ACCOMMODATIONS

10 (SO-AND-SO) DICTIONARY

【図６】　　FIG. 6

```
                      ┌──────────────┐
                      │   スタート     │──── START
                      └──────┬───────┘
                             │
  S600 ┌──────────────────────────────┐
       │      絞り込み条件を設定         │
       └──────────────┬───────────────┘
                             │ ◄─────────────────┐
  S601        ◇──────────────◇  NO              │
            ／  検索開始？    ＼────────────────┘
            ＼              ／
              ◇──────────◇
                   │ YES
  S602 ┌──────────────────────────────┐
       │  ジャンル名辞書及条件          │
       │  に合致する辞書を設定          │
       └──────────────┬───────────────┘
                             │
  S603 ┌──────────────────────────────┐
       │         認識処理               │
       └──────────────┬───────────────┘
                             │
  S604        ◇──────────────◇  YES
            ／  認識結果が    ＼──────────────────────┐
            ＼  施設名称？  ／                        │
              ◇──────────◇                          │
                   │ NO                              │
  S605 ┌──────────────────────┐    S609 ┌──────────────────────┐
       │ サブジャンル名辞書     │         │  市町村名辞書          │
       │ を設定                │         │  を設定               │
       └──────────┬───────────┘         └──────────┬───────────┘
                   │                                 │
  S606 ┌──────────────────────┐    S610 ┌──────────────────────┐
       │      認識処理          │         │      認識処理          │
       └──────────┬───────────┘         └──────────┬───────────┘
                   │                                 │
  S607 ┌──────────────────────┐    S611 ┌──────────────────────┐
       │  都道府県名辞書        │         │  全ての条件に合致する  │
       │  を設定               │         │  施設名称辞書を設定    │
       └──────────┬───────────┘         └──────────┬───────────┘
                   │                                 │
  S608 ┌──────────────────────┐    S612 ┌──────────────────────┐
       │      認識処理          │         │      認識処理          │
       └──────────┬───────────┘         └──────────┬───────────┘
                   │                                 │
                   └─────────────────────┐          │
                                          ▼◄─────────┘
                          S613 ┌──────────────────────┐
                               │ 結果表示、ＴＴＳ出力   │
                               │ 検索実行              │
                               └──────────┬───────────┘
                                          │
                               ┌──────────────┐
                               │    エンド     │──── END
                               └──────────────┘
```
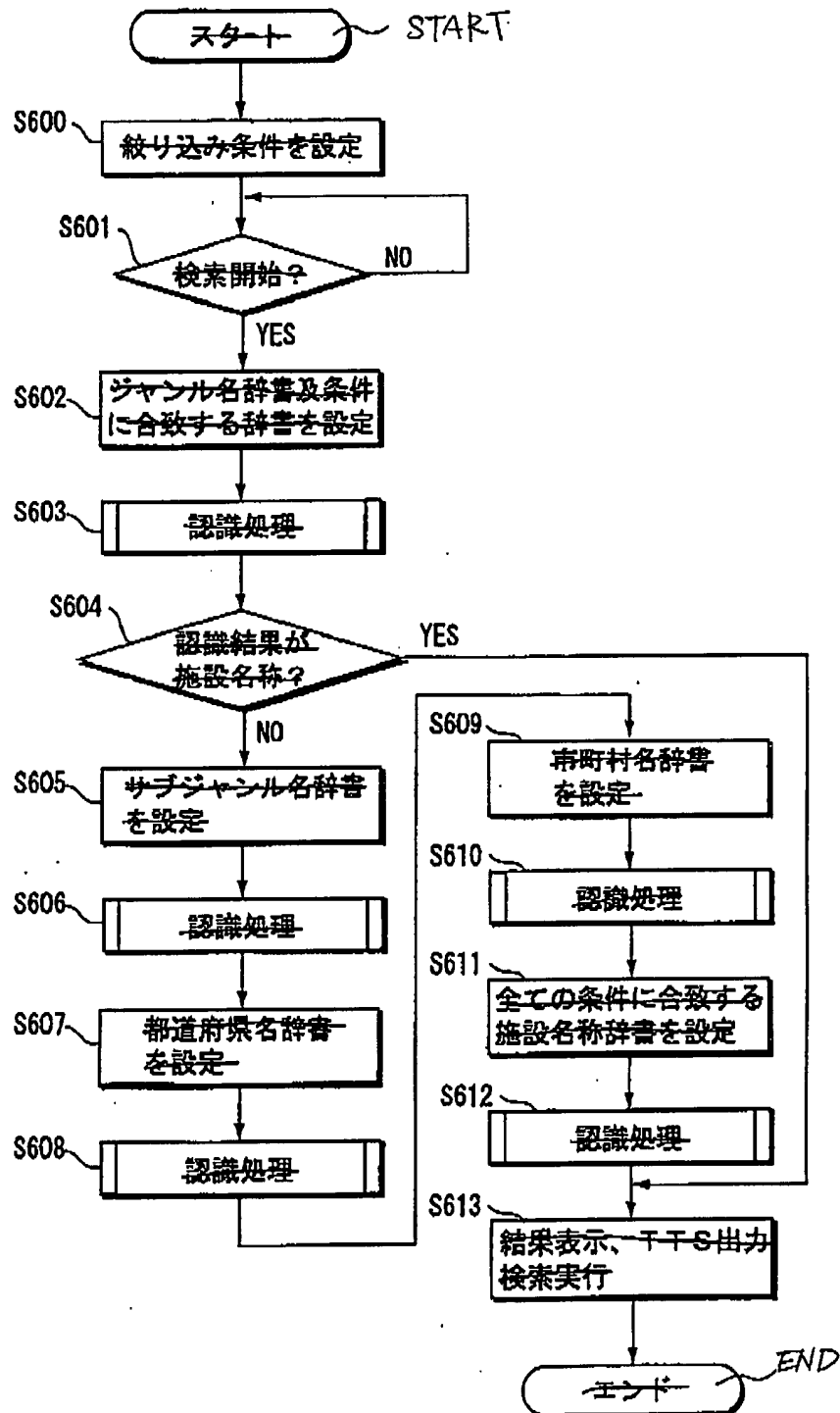
[FIG. 6]

S600 SET NARROWING-DOWN CONDITION

S601 IS RETRIEVAL STARTED?

S602 SET DICTIONARY MATCHED WITH CATEGORY NAME DICTIONARY

5　AND CONDITION

S603 RECOGNITION PROCESS

S604 IS RESULT OF RECOGNITION INSTITUTIONAL NAME?

S605 SET SUBCATEGORY NAME DICTIONARY

S606 RECOGNITION PROCESS

10　S607 SET PREFECTURAL NAME DICTIONARY

S608 RECOGNITION PROCESS

S609 SET MUNICIPALITY NAME DICTIONARY

S610 RECOGNITION PROCESS

S611 SET INSTITUTIONAL NAME DICTIONARY MATCHED WITH

15　ALL CONDITIONS

S612 RECOGNITION PROCESS

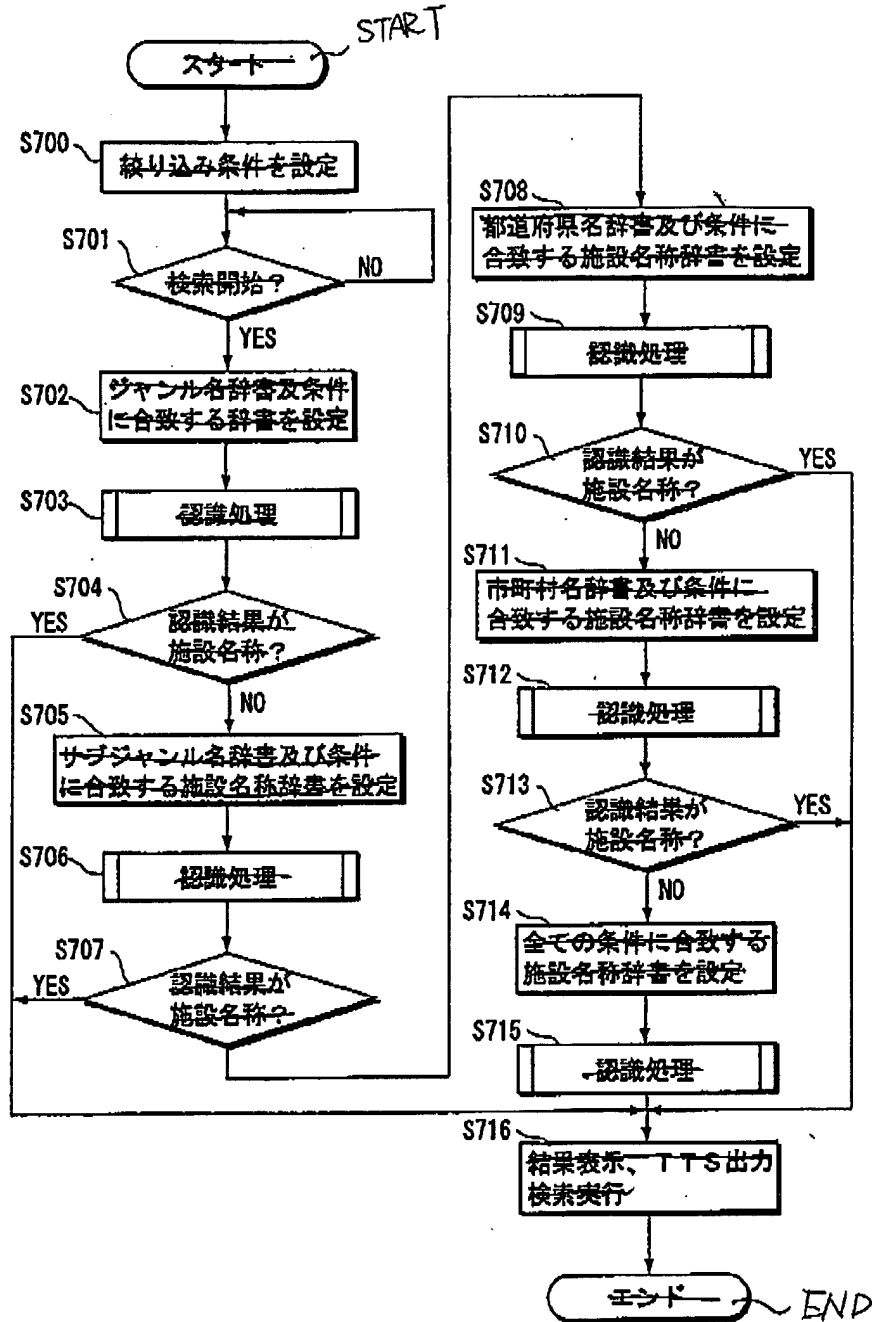S613 DISPLAY RESULT, OUTPUT TTS AND EXECUTE RETRIEVAL

【図7】　FIG.7

START スタート

S700 絞り込み条件を設定

S701 検索開始？ — NO

YES

S702 ジャンル名辞書及び条件に合致する辞書を設定

S703 認識処理

S704 認識結果が施設名称？ — YES

NO

S705 サブジャンル名辞書及び条件に合致する施設名称辞書を設定

S706 認識処理

S707 認識結果が施設名称？ — YES

S708 都道府県名辞書及び条件に合致する施設名称辞書を設定

S709 認識処理

S710 認識結果が施設名称？ — YES

NO

S711 市町村名辞書及び条件に合致する施設名称辞書を設定

S712 認識処理

S713 認識結果が施設名称？ — YES

NO

S714 全ての条件に合致する施設名称辞書を設定

S715 認識処理

S716 結果表示、TTS出力検索実行

END エンド

Proof - 2000/09/05

[FIG. 7]

S700 SET NARROWING-DOWN CONDITION

S701 IS RETRIEVAL STARTED?

S702 SET DICTIONARY MATCHED WITH CATEGORY NAME DICTIONARY

AND CONDITION

S703. RECOGNITION PROCESS

S704 S710, S713. IS RESULT OF RECOGNITION INSTITUTIONAL

NAME?

S705. SET INSTITUTIONAL NAME DICTIONARY MATCHED WITH

SUBCATEGORY NAME DICTIONARY AND CONDITION

S706. RECOGNITION PROCESS

S707. IS RESULT OF RECOGNITION INSTITUTIONAL NAME?

S708. SET INSTITUTIONAL NAME DICTIONARY MATCHED WITH

PREFECTURAL NAME DICTIONARY AND CONDITION

S709. RECOGNITION PROCESS

S710. IS RESULT OF RECOGNITION INSTITUTIONAL NAME?

S711. SET INSTITUTIONAL NAME DICTIONARY MATCHED WITH

MUNICIPALITY NAME DICTIONARY AND CONDITION

S712 RECOGNITION PROCESS

S713. IS RESULT OF RECOGNITION INSTITUTIONAL NAME?

S714. SET INSTITUTIONAL NAME DICTIONARY MATCHED WITH

ALL CONDITIONS

S715. RECOGNITION PROCESS
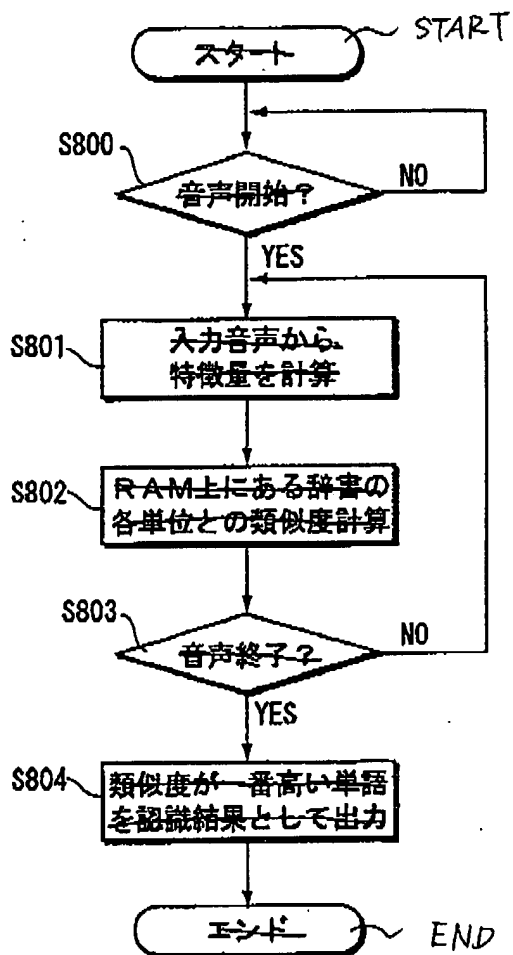
S716. DISPLAY RESULT, OUTPUT TTS AND EXECUTE RETRIEVAL

53

【図8】 FIG.8

スタート — START

S800 音声開始? — NO

YES

S801 入力音声から、特徴量を計算

S802 RAM上にある辞書の各単位との類似度計算

S803 音声終了? — NO

YES

S804 類似度が一番高い単語を認識結果として出力

エンド ～ END

[FIG. 8]

S800. IS VOICE STARTED?

S801. CALCULATE CHARACTERISTIC VALUE BASED UPON INPUT VOICE

5 S802. CALCULATE SIMILARITY BETWEEN EACH UNIT IN DICTIONARY LOADED INTO RAM

S803. IS VOICE FINISHED?

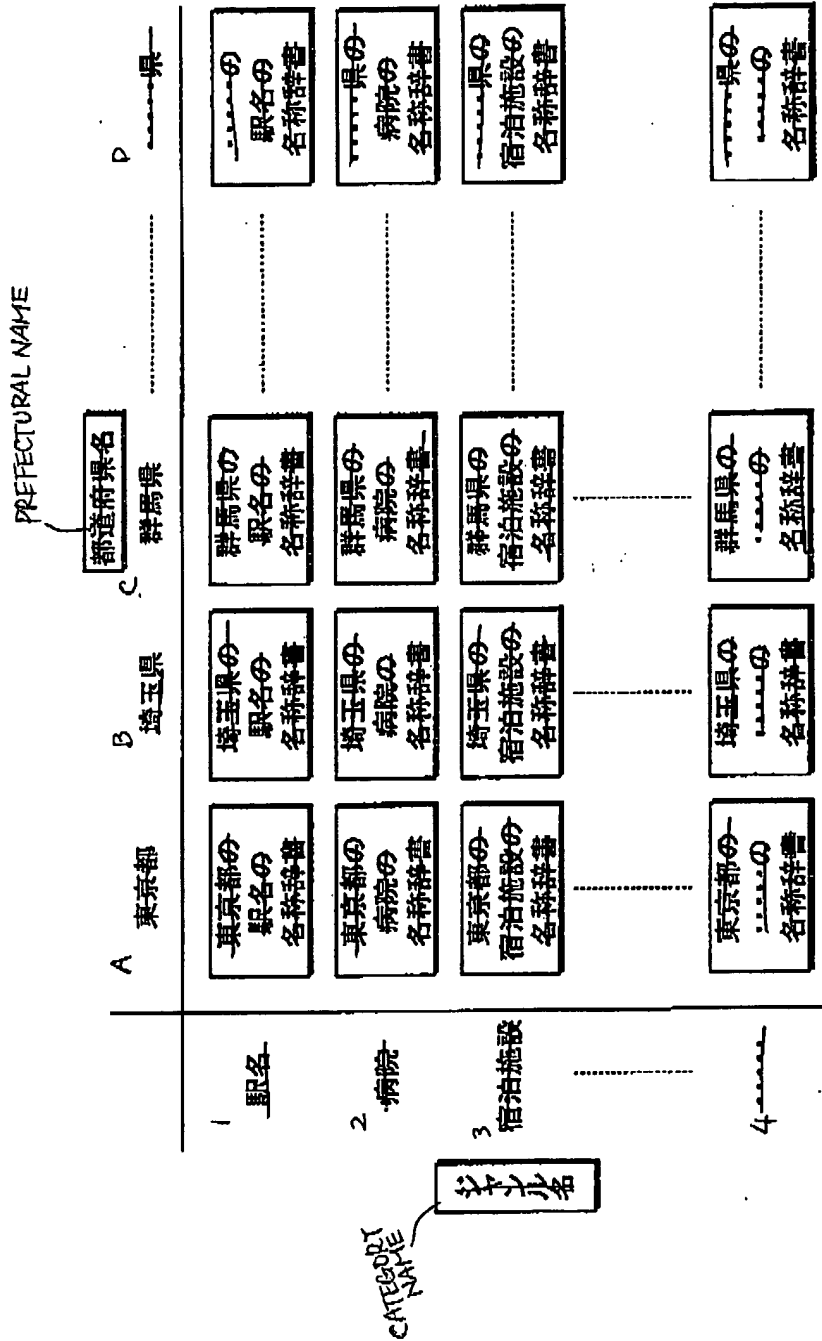S804. OUTPUT WORD SIMILARITY OF WHICH IS HIGHEST AS RESULT OF RECOGNITION

10 END

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[図９]

FIG. 9

PREFECTURAL NAME

CATEGORY NAME

Group of institutional name dictionaries classified according to narrowing-down condition such as prefectural name and category name

[FIG. 9]

CATEGORY NAME,

A:STATION NAME,

B:HOSPITAL,

5　C:ACCOMMODATIONS

PREFECTURAL NAME,

1. MEGALOPOLIS OF TOKYO,

2. SAITAMA PREFECTURE,

3. GUNMA PREFECTURE,

10　4. SO-AND-SO PREFECTURE

(First row)

A-1. TOKYO STATION NAME DICTIONARY

A-2. TOKYO HOSPITAL NAME DICTIONARY

A-3. A-TOKYO ACCOMMODATIONS NAME DICTIONARY

15　A-4. TOKYO SO-AND-SO NAME DICTIONARY

(Second row)

B-1. SAITAMA PREFECTURE STATION NAME DICTIONARY

B-2. SAITAMA PREFECTURE HOSPITAL NAME DICTIONARY

B-3. SAITAMA PREFECTURE ACCOMMODATIONS NAME DICTIONARY

20　B-4. SAITAMA PREFECTURE SO-AND-SO NAME DICTIONARY

(Third row)

C-1. GUNMA PREFECTURE STATION NAME DICTIONARY

C-2. GUNMA PREFECTURE HOSPITAL NAME DICTIONARY

C-3. GUNMA PREFECTURE ACCOMMODATIONS NAME DICTIONARY

25　C-4. GUNMA PREFECTURE SO-AND-SO NAME DICTIONARY

(Fourth row)

D-1. SO-AND-SO PREFECTURE STATION NAME DICTIONARY
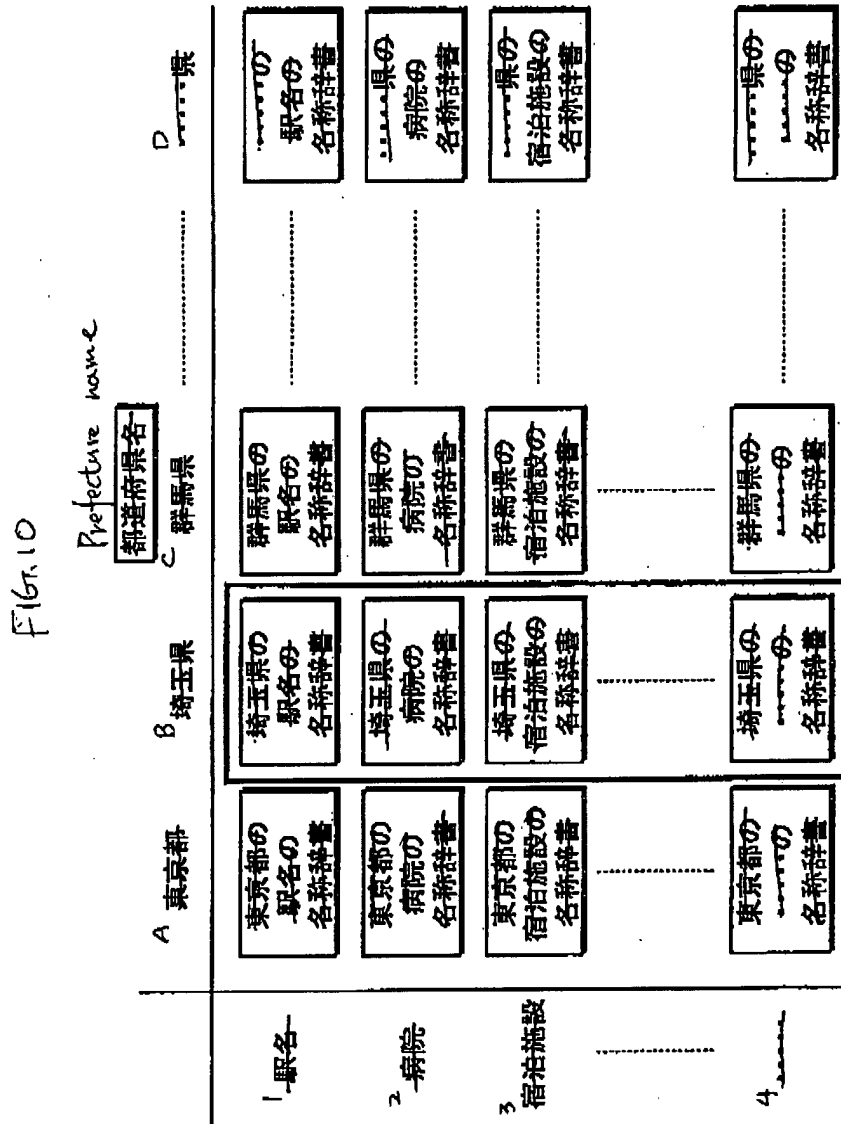
D-2. SO-AND-SO PREFECTURE HOSPITAL NAME DICTIONARY

D-3. SO-AND-SO PREFECTURE ACCOMMODATIONS NAME

5 DICTIONARY

D-4. SO-AND-SO PREFECTURE SO-AND-SO NAME DICTIONARY

図１０

FIG.10

Prefecture name

都道府県名

Category name

初期設定として「埼玉県」が設定された場合に選択される名称辞書群

Group of name dictionaries selected in case SAITAMA prefecture is set as initial setting

	A 東京都	B 埼玉県	C 群馬県		D ‥‥‥県
1 駅名	東京都の駅名の名称辞書	埼玉県の駅名の名称辞書	群馬県の駅名の名称辞書		‥‥‥の駅名の名称辞書
2 病院	東京都の病院の名称辞書	埼玉県の病院の名称辞書	群馬県の病院の名称辞書		‥‥‥県の病院の名称辞書
3 宿泊施設	東京都の宿泊施設の名称辞書	埼玉県の宿泊施設の名称辞書	群馬県の宿泊施設の名称辞書		‥‥‥県の宿泊施設の名称辞書
4 ‥‥‥	東京都の‥‥の名称辞書	埼玉県の‥‥の名称辞書	群馬県の‥‥の名称辞書		‥‥‥県の‥‥の名称辞書

[FIG. 10]

CATEGORY NAME,

A:STATION NAME,

B:HOSPITAL,

5　C:ACCOMMODATIONS

PREFECTURAL NAME,

1. MEGALOPOLIS OF TOKYO,

2. SAITAMA PREFECTURE,

3. GUNMA PREFECTURE,

10　4. SO-AND-SO PREFECTURE

(First row)

A-1. TOKYO STATION NAME DICTIONARY

A-2. TOKYO HOSPITAL NAME DICTIONARY

A-3. A-TOKYO ACCOMMODATIONS NAME DICTIONARY

15　A-4. TOKYO SO-AND-SO NAME DICTIONARY

(Second row)

B-1. SAITAMA PREFECTURE STATION NAME DICTIONARY

B-2. SAITAMA PREFECTURE HOSPITAL NAME DICTIONARY

B-3. SAITAMA PREFECTURE ACCOMMODATIONS NAME DICTIONARY

20　B-4. SAITAMA PREFECTURE SO-AND-SO NAME DICTIONARY

(Third row)

C-1. GUNMA PREFECTURE STATION NAME DICTIONARY

C-2. GUNMA PREFECTURE HOSPITAL NAME DICTIONARY

C-3. GUNMA PREFECTURE ACCOMMODATIONS NAME DICTIONARY

25　C-4. GUNMA PREFECTURE SO-AND-SO NAME DICTIONARY

(Fourth row)

D-1. SO-AND-SO PREFECTURE STATION NAME DICTIONARY

D-2. SO-AND-SO PREFECTURE HOSPITAL NAME DICTIONARY

D-3. SO-AND-SO PREFECTURE ACCOMMODATIONS NAME

5 DICTIONARY
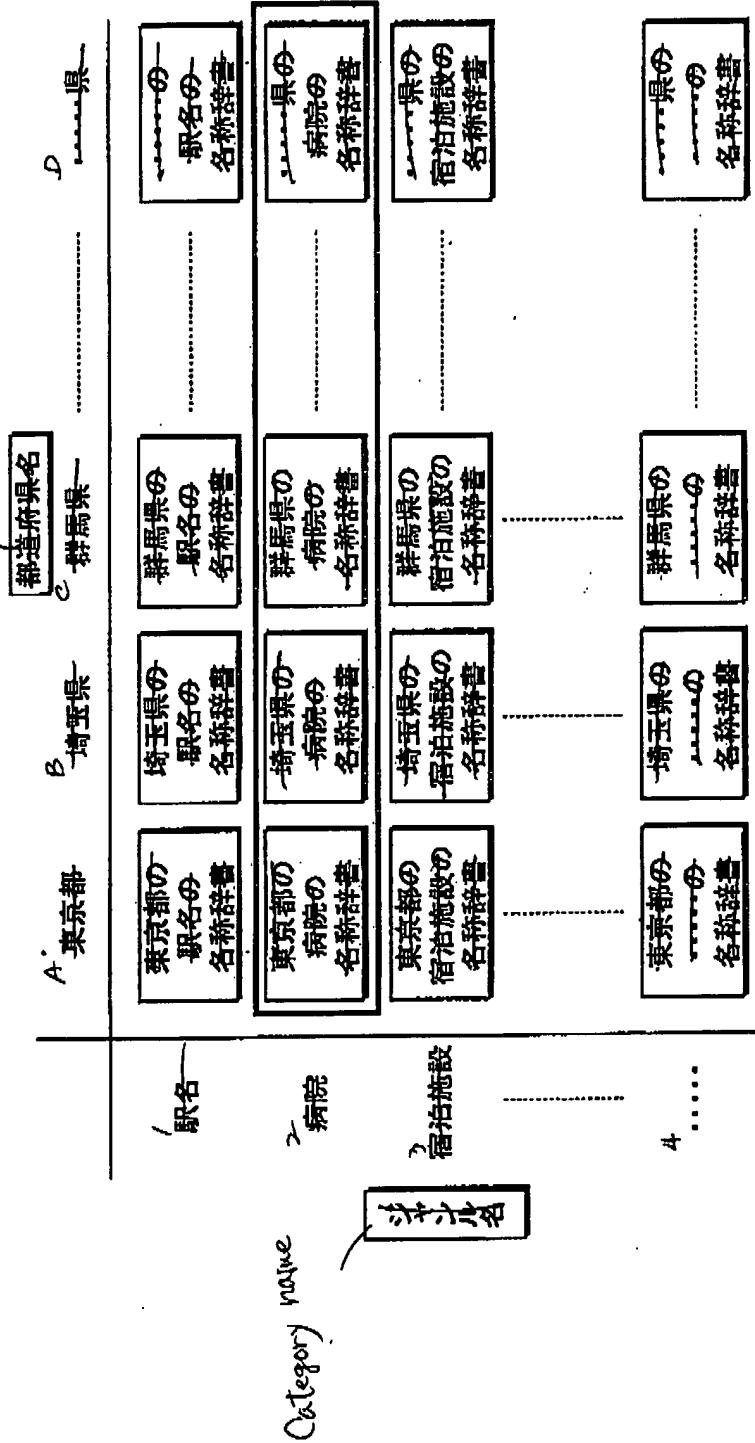
D-4. SO-AND-SO PREFECTURE SO-AND-SO NAME DICTIONARY

[図１１]

FIG.11

Prefective name

都道府県名

Category name

カテゴリ名

	A 東京都	B 埼玉県	C 群馬県		D ——県
1 駅名	東京都の駅名の名称辞書	埼玉県の駅名の名称辞書	群馬県の駅名の名称辞書		——県の駅名の名称辞書
2 病院	東京都の病院の名称辞書	埼玉県の病院の名称辞書	群馬県の病院の名称辞書		——県の病院の名称辞書
3 宿泊施設	東京都の宿泊施設の名称辞書	埼玉県の宿泊施設の名称辞書	群馬県の宿泊施設の名称辞書		——県の宿泊施設の名称辞書
4 ……	東京都の——の名称辞書	埼玉県の——の名称辞書	群馬県の——の名称辞書		——県の——の名称辞書

初期設定として「病院」が設定された場合に選択される各名称辞書部

Group of name dictionaries selected in case hospital is set as initial setting.

[FIG. 11]

A:STATION NAME,

B:HOSPITAL,

C:ACCOMMODATIONS

5 PREFECTURAL NAME,

1. MEGALOPOLIS OF TOKYO,

2. SAITAMA PREFECTURE,

3. GUNMA PREFECTURE,

4. SO-AND-SO PREFECTURE

10 (First row)

A-1. TOKYO STATION NAME DICTIONARY

A-2. TOKYO HOSPITAL NAME DICTIONARY

A-3. A-TOKYO ACCOMMODATIONS NAME DICTIONARY

A-4. TOKYO SO-AND-SO NAME DICTIONARY

15 (Second row)

B-1. SAITAMA PREFECTURE STATION NAME DICTIONARY

B-2. SAITAMA PREFECTURE HOSPITAL NAME DICTIONARY

B-3. SAITAMA PREFECTURE ACCOMMODATIONS NAME DICTIONARY

B-4. SAITAMA PREFECTURE SO-AND-SO NAME DICTIONARY

20 (Third row)

C-1. GUNMA PREFECTURE STATION NAME DICTIONARY

C-2. GUNMA PREFECTURE HOSPITAL NAME DICTIONARY

C-3. GUNMA PREFECTURE ACCOMMODATIONS NAME DICTIONARY

C-4. GUNMA PREFECTURE SO-AND-SO NAME DICTIONARY

25 (Fourth row)

D-1. SO-AND-SO PREFECTURE STATION NAME DICTIONARY

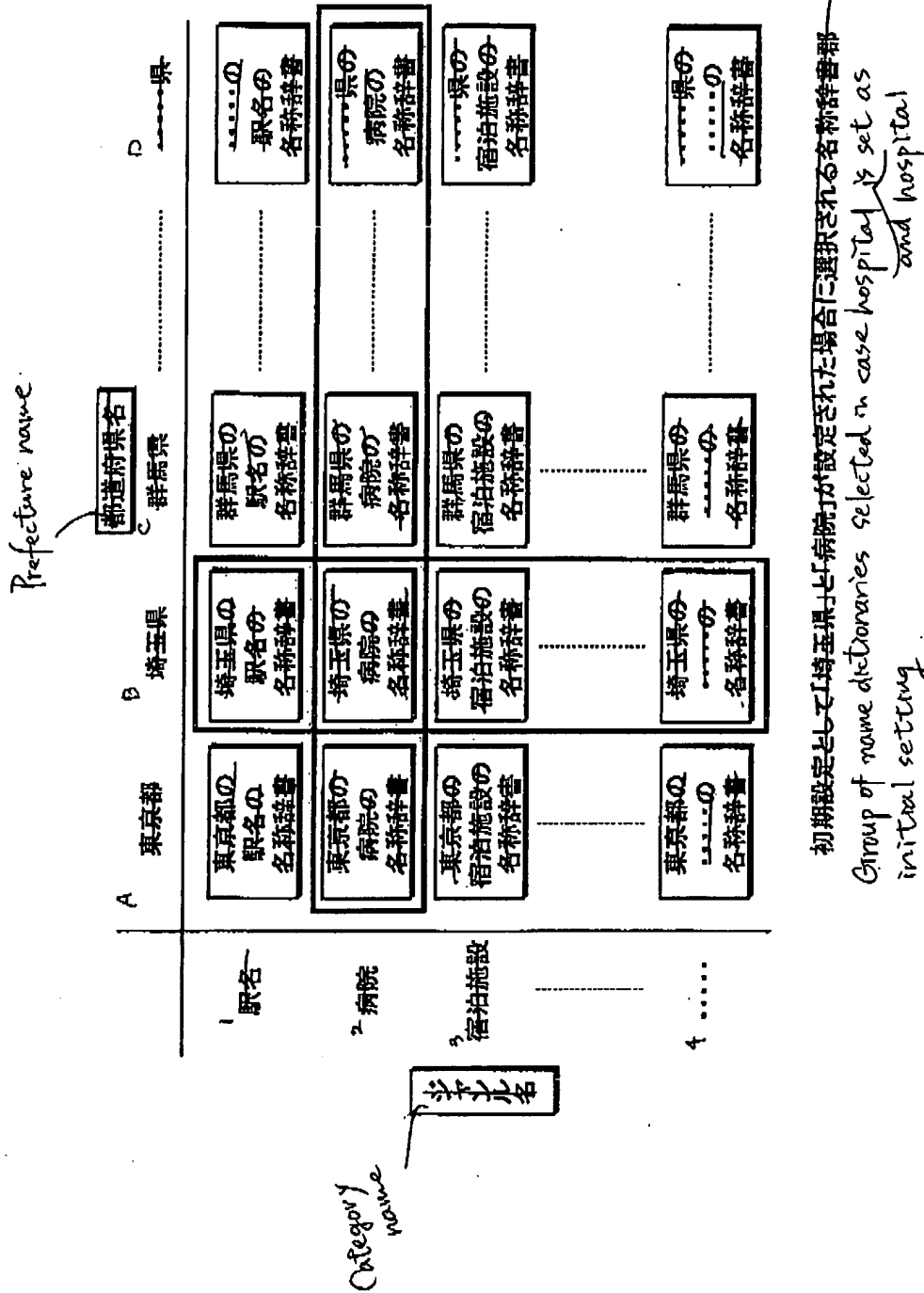D-2. SO-AND-SO PREFECTURE HOSPITAL NAME DICTIONARY

D-3. SO-AND-SO PREFECTURE ACCOMMODATIONS NAME DICTIONARY

5 D-4. SO-AND-SO PREFECTURE SO-AND-SO NAME DICTIONARY

【図12】

FIG.12

[FIG. 12]

CATEGORY NAME,

A:STATION NAME,

B:HOSPITAL,

5 C:ACCOMMODATIONS

PREFECTURAL NAME,

1. MEGALOPOLIS OF TOKYO,

2. SAITAMA PREFECTURE,

3. GUNMA PREFECTURE,

10 4. SO-AND-SO PREFECTURE

(First row)

A-1. TOKYO STATION NAME DICTIONARY

A-2. TOKYO HOSPITAL NAME DICTIONARY

A-3. A-TOKYO ACCOMMODATIONS NAME DICTIONARY

15 A-4. TOKYO SO-AND-SO NAME DICTIONARY

(Second row)

B-1. SAITAMA PREFECTURE STATION NAME DICTIONARY

B-2. SAITAMA PREFECTURE HOSPITAL NAME DICTIONARY

B-3. SAITAMA PREFECTURE ACCOMMODATIONS NAME DICTIONARY

20 B-4. SAITAMA PREFECTURE SO-AND-SO NAME DICTIONARY

(Third row)

C-1. GUNMA PREFECTURE STATION NAME DICTIONARY

C-2. GUNMA PREFECTURE HOSPITAL NAME DICTIONARY

C-3. GUNMA PREFECTURE ACCOMMODATIONS NAME DICTIONARY

25 C-4. GUNMA PREFECTURE SO-AND-SO NAME DICTIONARY

(Fourth row)

D-1. SO-AND-SO PREFECTURE STATION NAME DICTIONARY

D-2. SO-AND-SO PREFECTURE HOSPITAL NAME DICTIONARY

D-3. SO-AND-SO PREFECTURE ACCOMMODATIONS NAME

5 DICTIONARY

D-4. SO-AND-SO PREFECTURE SO-AND-SO NAME DICTIONARY

【図1-3】

FIG.13

① システム: 「ジャンルの名称をどうぞ」
② ユーザ: 「教育施設」
③ システム: 「次のジャンルの名称をどうぞ」
④ ユーザ: 「高校」
⑤ システム: 「都道府県名をどうぞ」
⑥ ユーザ: 「東京都」
⑦ システム: 「市区町村名をどうぞ」
⑧ ユーザ: 「渋谷区」
⑨ システム: 「名称をどうぞ」
　　システム: 「○○学園」

[FIG. 13]

1) SYSTEM: "PLEASE VOCALIZE CATEGORY NAME"

2) USER : "EDUCATIONAL INSTITUTION"

3) SYSTEM: "NEXT CATEGORY NAME, PLEASE"

5　4) USER : "HIGH SCHOOL"

5) SYSTEM: "PREFECTURAL NAME, PLEASE"

6) USER : "TOKYO"

7) SYSTEM: "MUNICIPALITY NAME, PLEASE"

8) USER : "SHIBUYA WARD"

10　9) SYSTEM: "NAME, PLEASE"

USER : "SO-AND-SO SCHOOL"